

Patent Claims:

1. Brake system of the 'brake-by-wire' type for actuating a motor vehicle brake system comprising:
a brake booster which is operable in response to the driver's wish both by means of a brake pedal and by means of an electronic regulating and control unit,
with a means being provided to decouple a force-transmitting connection between the brake pedal and the brake booster in the 'brake-by-wire' operating mode,
a master brake cylinder connected downstream of the brake booster in terms of effect, to the pressure chambers of which wheel brakes of the motor vehicle are connected,
a pedal travel simulator which interacts with the brake pedal and due to which a resetting force acting on the brake pedal can be simulated in the 'brake-by-wire' operating mode independently of an actuation of the brake booster, and which can be enabled in the 'brake-by-wire' operating mode when the force-transmitting connection between the brake pedal and the brake booster is decoupled and can be disabled outside the 'brake-by-wire' operating mode,
a first sensor (6) to sense the brake pedal actuating travel (S_{Bp}), a second sensor (18) to sense the travel (S_{Ds}) of an output member (20) of the brake booster, and a third sensor (i.e. a pressure sensor (21)) to sense the brake pressure prevailing in the system, the signals of which sensors are sent to the electronic regulating and control unit (7),
c h a r a c t e r i z e d in that the electronic regulating and control unit (7) includes a control circuit

for controlling the travel (S_{Ds}) covered by the output member (20) of the brake booster (3), the nominal value ($S_{Dsnominal}$) of the travel (S_{Ds}) covered by the output member (20) of the brake booster (3) being calculated corresponding to the actuating travel (S_{Bp}) of the brake pedal (1), and a monitoring module (24) being provided which, in the case of a fault such as the inclusion of air or brake circuit failure, performs a partial compensation of the extension of the travel (S_{Ds}) covered by the output member (20) of the brake booster (3), which extension is caused by the fault.

2. Brake system of the 'brake-by-wire' type for actuating a motor vehicle brake system comprising:
a brake booster which is operable in response to the driver's wish both by means of a brake pedal and by means of an electronic regulating and control unit,
with a means being provided to decouple a force-transmitting connection between the brake pedal and the brake booster in the 'brake-by-wire' operating mode,
a master brake cylinder connected downstream of the brake booster in terms of effect, to the pressure chambers of which wheel brakes of the motor vehicle are connected,
a pedal travel simulator which interacts with the brake pedal and due to which a resetting force acting on the brake pedal can be simulated in the 'brake-by-wire' operating mode independently of an actuation of the brake booster, and which can be enabled in the 'brake-by-wire' operating mode when the force-transmitting connection between the brake pedal and the brake booster is decoupled

and can be disabled outside the 'brake-by-wire' operating mode,

a first sensor to sense the brake pedal actuating travel (S_{Bp}), a second sensor (18) to sense the travel (S_{Ds}) of an output member of the brake booster, and a third sensor (i.e. a pressure sensor (21)) to sense the brake pressure prevailing in the system, the signals of which sensors are sent to the electronic regulating and control unit (7), characterized in that the electronic regulating and control unit (7) includes a control circuit for controlling the travel (S_{Ds}) covered by the output member (20) of the brake booster (3) and the hydraulic pressure (p) prevailing in the system, the nominal values ($S_{Dsnominal}$, $p_{nominal}$) thereof being calculated corresponding to the actuating travel (S_{Bp}) of the brake pedal (1), and a monitoring module (24) being provided which, in the case of a fault such as the inclusion of air or brake circuit failure, switches the control circuit from the travel control mode to the pressure control mode in order to perform a compensation of the extension of the travel (S_{Ds}) covered by the output member (20) of the brake booster (3), which extension is caused by the fault.

3. Brake system as claimed in claim 1 or 2,

characterized in that a pressure fluid volume/pressure characteristic curve is stored in the monitoring module (24), i.e. the dependency of the pressure fluid volume absorption (Q) of the brakes or of the travel (S_{Ds}) covered by the output member (20) of the brake booster (3) and corresponding to the pressure fluid volume absorption (Q) on the hydraulic pressure (p) Q or

$S_{Ds} = f(p)$, and in that the monitoring module (24) is furnished with the actual values ($S_{Dsactual}$, p_{actual}) of the travel (S_{Ds}) covered by the output member (20) of the brake booster (3) and of the hydraulic pressure (p) prevailing in the system, and a travel value (S_{model}) corresponding to the nominal value ($Q_{nominal}$) of the pressure fluid volume is calculated from the actual pressure value (p_{actual}) and compared with the actual value ($S_{Dsactual}$) of the travel (S_{Ds}) covered by the output member (20) of the brake booster (3), and a correction value (S_{corr}) is produced in the monitoring module (24) from which a fault in the system is inferred, when the comparison result ($\Delta S_{diff} = S_{model} - S_{Dsactual}$) exceeds a threshold value ($S_{threshold}$).

4. Brake system as claimed in claims 1 and 3,
c h a r a c t e r i z e d in that the partial compensation of the extension of the travel (S_{Ds}) covered by the output member (20) of the brake booster (3), which extension is caused by the fault, is performed by adding a correction value (S_{corr}) to the nominal value ($S_{Dsnominal}$).
5. Brake system as claimed in claim 4,
c h a r a c t e r i z e d in that the correction value (S_{corr}) corresponds to half the result of the comparison ($\Delta S/2$).
6. Brake system as claimed in claims 2 and 3,
c h a r a c t e r i z e d in that the switch-over of the control circuit from the travel control mode to the

pressure control mode is performed by the correction value (S_{corr}).

7. Brake system as claimed in any one of the preceding claims,
c h a r a c t e r i z e d in that the actual values ($S_{Dsactual}$, p_{actual}) undergo a low-pass filtering operation.
8. Brake system as claimed in claims 2, 3, or 6,
c h a r a c t e r i z e d in that a transition function, e.g. low-pass filtering or a ramp function, is activated when a case of fault is detected.
9. Brake system as claimed in any one of claims 1 to 8,
c h a r a c t e r i z e d in that a warning lamp (31) is activated when a case of fault is detected in the system.